

**From:** [Goldmann, Elizabeth](#)  
**To:** [Blaine, Marjorie E SPL](#)  
**Cc:** [Campbell, Rich](#)  
**Subject:** Draft Deliberative. Do not release under FOIA  
**Date:** Wednesday, December 16, 2015 4:12:00 PM  
**Attachments:** [Draft Table of Contents.Rosemont Mine impact analysis.docx](#) All 3 attachments withheld - b5 deliberative  
[Draft impact analysis.Rosemont Mine.docx](#)  
[Draft Table 1.Rosemont Mine impact analysis.docx](#)

---

Dear Marjorie

For your consideration, EPA is providing you with a draft deliberative document on our analysis of the Rosemont Mine pursuant to EPA's 404(b)(1) Guidelines at 40 CFR 230.10(c). (b)(5) - deliberative

[REDACTED]

[REDACTED]

Please call or email me if you have any questions.

Sincerely,

Elizabeth

























































































**From:** [Goldmann, Elizabeth](#)  
**To:** [Blaine, Marjorie E SPL](#)  
**Cc:** [Leidy, Robert](#); [Jessop, Carter](#)  
**Subject:** EPA technical comments on Rosemont HMMP - September 26, 2014  
**Date:** Tuesday, April 21, 2015 12:15:00 PM  
**Attachments:** [EPA Technical Comments on Rosemont HMMP dated September 26, 2014.pdf](#) attachment withheld - b5  
deliberative

---

Hi Marjorie

EPA is providing you with technical comments on the *Rosemont Copper Project Revised Habitat Mitigation and Monitoring Plan Permit No. SPL-2008-00816-MB* dated September 26, 2014 (HMMP). These comments are in addition to the comments EPA previously provided to the Corps on the HMMP.

Please call or email me if you have any questions.

Sincerely,

Elizabeth









**From:** [Goldmann, Elizabeth](#)  
**To:** [Blaine, Marjorie E SPL](#)  
**Subject:** FW: Rosemont Water Quality data  
**Date:** Friday, July 17, 2015 11:20:00 AM  
**Attachments:** [image001.png](#)  
[image002.png](#)  
[image003.png](#)  
[image004.png](#)

---

Hi Marjorie

Here is some of the WQ data referenced in the SIR. The link includes a cover letter from Hudbay to USFS dated January 16, 2015. It states, "Some of this data was provided to ADEQ during the 401 evaluation as well and represents the most up to date information we have available at this time." The data in the attachments go back several years, so it remains unclear whether they provided the 2014 data on Davidson Canyon to ADEQ prior to issuance of the 401 certification.

E.

---

**From:** Jessop, Carter  
**Sent:** Friday, July 17, 2015 10:31 AM  
**To:** Goldmann, Elizabeth  
**Subject:** FW: Rosemont Water Quality data

Carter W. Jessop  
U.S. EPA, Region 9  
Environmental Review Section (ENF-4-2)  
75 Hawthorne Street  
San Francisco, CA 94105  
(415) 972-3815  
[jessop.carter@epa.gov](mailto:jessop.carter@epa.gov)

---

**From:** Vogel, Mindy S -FS [<mailto:msvogel@fs.fed.us>]  
**Sent:** Friday, July 17, 2015 10:27 AM  
**To:** Jessop, Carter  
**Subject:** RE: Rosemont Water Quality data

Hi Carter.

Please look at SIR Reference "Hudbay 2015e". It's on the website and here's the direct link:  
<http://rosemonteis.us/files/references/048930.pdf>

If you have any other questions, please let me know.

**Mindy Sue Vogel**  
Minerals & Geology Program Manager



**Forest Service  
Coronado National Forest**

**p: 520-388-8327**

**(b) (6)**

**f: 520-388-8305**

**[msvogel@fs.fed.us](mailto:msvogel@fs.fed.us)**

300 W Congress St

Tucson, AZ 85701

[www.fs.fed.us](http://www.fs.fed.us)



**Caring for the land and serving people**

---

**From:** Jessop, Carter [<mailto:JESSOP.CARTER@EPA.GOV>]

**Sent:** Thursday, July 16, 2015 6:12 PM

**To:** Vogel, Mindy S -FS

**Subject:** Rosemont Water Quality data

Hello Mindy,

Please see below: **(b)(5) Deliberative**

[REDACTED]

Thank you for your assistance.

-Carter Jessop

Carter W. Jessop  
U.S. EPA, Region 9  
Environmental Review Section (ENF-4-2)  
75 Hawthorne Street  
San Francisco, CA 94105  
(415) 972-3815  
[jessop.carter@epa.gov](mailto:jessop.carter@epa.gov)

---

**From:** Goldmann, Elizabeth

**Sent:** Thursday, July 16, 2015 2:45 PM

**To:** Jessop, Carter

**Subject:** RM

Hi Carter,

**(b)(5) Deliberative**

(b)(5) Deliberative

(b)(5) Deliberative











**From:** [Goldmann, Elizabeth](#)  
**To:** [Castanon, David J SPL](#)  
**Subject:** FW: "Other Water Quality Aspects" of permit issuance for Rosemont mine in light of state actions under section 401 CWA  
**Date:** Tuesday, April 21, 2015 3:37:00 PM  
**Attachments:** [Letter to Colonel Kim Colloton.pdf](#)

---

Hi Dave

My apologies! I just realized your name was misspelled in the email address.

-Elizabeth

---

**From:** Goldmann, Elizabeth  
**Sent:** Thursday, April 16, 2015 10:33 AM  
**To:** 'David.J.Castanon@usace.army.mil'; 'Blaine, Marjorie E SPL'; 'Diebolt, Sallie SPL'  
**Subject:** "Other Water Quality Aspects" of permit issuance for Rosemont mine in light of state actions under section 401 CWA

Dear Dave, Sallie and Marjorie,

Please see the attached letter from Jared Blumenfeld, Regional Administrator, to Colonel Kim Colloton, District Engineer, regarding the proposed Rosemont copper mine. Please contact me if you have any questions.

Best,

Elizabeth



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street  
San Francisco, CA 94105-3901

APR 14 2015

OFFICE OF THE  
REGIONAL ADMINISTRATOR

Colonel Kim Colloton  
District Engineer, Los Angeles District  
U.S. Army Corps of Engineers  
P.O. Box 532711  
Los Angeles, California 90053-2325

Subject: "Other Water Quality Aspects" of permit issuance for the Rosemont Mine in light of state actions under §401 of the Clean Water Act

Dear Colonel Colloton:

On February 3, 2015, the Arizona Department of Environmental Quality (ADEQ) issued the Clean Water Act (CWA) §401 Water Quality Certification (certification) for the proposed Rosemont Copper Project (Rosemont mine) in Pima County, Arizona. After careful review and consultation with the state, EPA has determined that the impacts of the project include substantial water quality aspects which may be outside the scope of the state's §401 certification review. Thus, EPA believes the certification alone is unlikely to provide sufficient measures to safeguard the water quality of the Cienega Creek watershed, including stream reaches meeting or exceeding existing water quality standards under CWA §303 (these CWA "Tier 3" waters in Arizona are designated "Outstanding Arizona Waters" or OAW).<sup>1</sup> As prescribed under Corps regulations at 33 CFR 320.4(d), I am requesting your consideration of these "other water quality aspects" when making your §404 CWA permit decision.<sup>2</sup>

The Rosemont Copper Project Final Environmental Impact Statement (FEIS) and other documentation concluded the Rosemont mine, if constructed, would adversely modify surface and groundwater hydrology, sediment transport, and pollutant loadings in the watershed. The state CWA §401 certification lacks sufficient, specific preventative actions to avoid these adverse impacts to water quality, creating a substantial risk to designated beneficial use standards set by the state for Davidson Canyon and Cienega Creek. In general, the certification relies upon limited, voluntary (i.e., non-enforceable) post-discharge monitoring that may detect water quality degradation after it occurs, and includes insubstantial corrective actions to be developed at a later time. Many of EPA's concerns identified in comments on the state's February 21, 2014 draft certification (letter attached) remain unaddressed by the final certification. Among the most critical water quality aspects that remain outstanding are:

1. **Water quality impact avoidance:** Without reasonable assurance of impact avoidance, the available information suggests Tier 3 antidegradation standards are very likely to be violated.

<sup>1</sup>Federal antidegradation policy prohibits any degradation of Tier 3 waters, regardless of economic or social development needs (40 CFR 131.2(a)). Arizona's anti degradation rules reinforce this prohibition (ACC R18-11-107).

<sup>2</sup> Corps Regulatory Guidance Letter 90-04 and the Memorandum for *Major Subordinate Commands and District Commands* dated October 29, 2009



2. **Water quality impact minimization:** A specific and complete monitoring program is necessary at the outset ensure rapid detection of impacts should a robust preventative program fail, and provide for the ability to deploy corrective measures;
3. **Water quality impact mitigation:** Specification of, and enforceable commitment to, available and sufficient corrective measures are needed to offset mine-related reduction of assimilative capacity, changes in downstream sediment yield, and other potential diminutions of water quality that may be detected. Presently, the corrective measures proposed in a “Surface Water Mitigation Plan” lack specificity regarding their ability to arrest and reverse water quality problems once water quality degradation of OAWs or other waters has been detected.<sup>3</sup>

We believe these water quality aspects are directly relevant to several of the Corps’ findings necessary for a permit decision, under both the 404(b)(1) Guidelines and Public Interest Review. The state’s inclusion of general and specific conditions in the certification are highly unlikely to avoid potential water quality degradation, detect anticipated or unanticipated degradation, or mitigate for those impacts. The project’s projected groundwater drawdown and flow and sediment reductions in Davidson Canyon and Cienega Creek have yet to be adequately addressed. These outcomes would represent a failure to maintain and protect existing water quality in those OAWs in violation of the CWA antidegradation policy. The certified discharges of fill material would thus contribute to violation of applicable water quality standards, in conflict with the Guidelines at 40 CFR 230.10(b).

The Corps’ permit decision also includes an evaluation of the impacts of the proposed project on water supply and conservation (33 CFR 320.4). Within the Tucson Active Management Area (AMA), a population of over 811,000 obtains 69% of its municipal water supplies from groundwater. Agriculture relies on subsurface supply to provide 70% of its water.<sup>4</sup> The Upper Santa Cruz subbasin, where Rosemont is sited, provides 20% of the groundwater recharge in the Tucson AMA.<sup>5</sup> The mine’s water needs would represent a new demand that increases pumping by 6-7% during an overall drying trend.<sup>6</sup> Drought, climate change, and the significant uncertainty regarding the potential to successfully recharge subsurface supplies, only heighten EPA’s concerns over Rosemont mine’s projected water use in an aquifer already subject to groundwater overdraft.<sup>7</sup>

According to the FEIS, groundwater pumping for the mining operation and drawdown from the open pit will adversely impact public and private water supplies.<sup>8</sup> As a result of pumping groundwater for the mine, an estimated 500-550 private and municipal wells would be impacted by drawdown in groundwater levels over ten feet.<sup>9</sup> Groundwater drawdown from the mine’s pit within the Davidson Canyon/Cienega Basin, would impact an additional estimated 360-370 well owners with water level

---

<sup>3</sup>The SWMP developed under the certification does not meet its stated objective of describing mitigation commitments to offset predicted reductions in surface water flows and sediment yield. For example, it proposes a conceptual mitigation water supply of insufficient quantity to offset flow reductions predicted by the FEIS, and provides no assurance of that water’s future availability.

<sup>4</sup> [www.azwater.gov/azdwr/StatewidePlanning/WaterAtlas/ActiveManagementAreas/Volume\\_8/final.pdf](http://www.azwater.gov/azdwr/StatewidePlanning/WaterAtlas/ActiveManagementAreas/Volume_8/final.pdf).

<sup>5</sup>Letter to Jared Blumenfeld, EPA Regional Administrator, and Colonel Kim Colloton, Corps District Engineer, from Ray Carol, Pima County Supervisor dated November 18, 2014.

<sup>6</sup> FEIS, p. 338.

<sup>7</sup> FEIS, p. 322 and p. 328.

<sup>8</sup> FEIS, pp. 328-329.

<sup>9</sup> FEIS, p. 330 and Table 58, p. 337. Groundwater drawdown is estimated at up to 90 feet adjacent mine site pumping, and up to 10 feet within an approximately 3-4 mile radius (42 square miles).



declines ranging from 15-85 feet.<sup>10</sup> Private and public well owners and suppliers have expressed concern regarding the impact on the quality and quantity of their water supply, as well as the increased costs associated with pumping from a deeper aquifer if the mine is constructed.<sup>11</sup> Rosemont mine proposes to conduct groundwater recharge as a voluntary measure, but the location and effectiveness of recharge is unknown and, therefore, may not benefit the Upper Santa Cruz subbasin.<sup>12</sup>

Finally, the Cienega Creek watershed is located in a near pristine landscape rich in biodiversity. As such, it is an important location for outdoor recreation. The State of Arizona has designated reaches of both Davidson Canyon and Cienega Creek as OAWs due to, among other factors, their exceptional ecological and recreational significance and the presence of federally endangered and threatened species. Water quality in these reaches currently meets or exceeds applicable water quality standards, and any lowering of water quality in OAWs is prohibited. Public and private utilization of this habitat contributes to a robust recreation and tourism industry in the region.<sup>13</sup> Loss of recreational and aesthetic value stemming from the mine's various adverse impacts to water quality are an important additional consideration in permit authorization (33 CFR 320.4).

In summary, sufficient evidence exists to conclude that several water quality aspects that may be beyond the scope of the state's §401 water quality certification remain outstanding, which EPA recommends be considered in your findings under the §404(b)(1) Guidelines and Public Interest Review. Please do not hesitate to contact me with any questions, or have your Regulatory Division Chief contact Jason Brush, our Wetlands Section Supervisor, at (415) 972-3483.

Sincerely,



Jared Blumenfeld

Enclosure: EPA letter to ADEQ dated April 7, 2014

cc: Jim Upchurch, U.S. Forest Service  
Steve Spangle, U.S. Fish and Wildlife Service  
Ray Suazo, Bureau of Land Management  
Trevor Baggione, Arizona Department of Environmental Quality

---

<sup>10</sup> FEIS, p. 350.

<sup>11</sup> Letter to Jared Blumenfeld, EPA Regional Administrator and Colonel Kim Colloton, Corps District Engineer dated November 12, 2014 signed by 76 private well owners and public water suppliers and users.

<sup>12</sup> FEIS, pp. 360-361. In addition, Rosemont Mine offered a legally binding residential well protection plan valid during the operation of the mine, but not all well owners have agreed to sign the agreement.

<sup>13</sup> \$2.95 billion is spent annually for tourism and outdoor recreational activities in Pima and Santa Cruz Counties. An analysis by Sonoran Institute estimates a one percent reduction of travel and tourism-related spending in the region would result in an economic loss greater than the entire annual payroll of the mine. J.E. Marlow. 2007. *Mining's Potential Economic Impacts in the Santa Rita and Patagonia Mountains Region of Southeastern Arizona*. Sonoran Institute Study.





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street  
San Francisco, CA 94105-3901

APR 07 2014

Michael Fulton, Water Quality Division Director  
Arizona Department of Environmental Quality  
Surface Water Section/State 401 Certification/MS 5415A-1  
1110 West Washington Street  
Phoenix, Arizona 85007

Subject: State of Arizona Clean Water Act (CWA) Draft Section 401 Water Quality Certification for  
the Rosemont Copper Project, Pima County, Arizona

Dear Mr. Fulton:

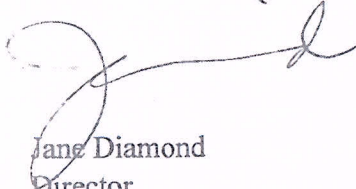
Thank you for the extended opportunity to review the draft CWA Section 401 water quality certification (certification) and supporting information for discharges associated with the proposed Rosemont Copper Project. With Arizona's designation of portions of the Cienega Creek watershed as "Outstanding Arizona Waters" (OAWs), the EPA supports the state's broadest exercise of legal discretion to protect these remarkable resources. We are submitting the enclosed comments as a continuation of our interagency coordination on the mine's potential water quality consequences to the OAWs of the Cienega Creek watershed.

After careful consideration, EPA believes the draft certification and supporting information provide an insufficient basis from which to conclude existing water quality will be maintained (*e.g.*, ongoing attainment of designated beneficial uses). In general, the draft certification relies on lagging indicators (post-discharge monitoring) to trigger corrective actions, rather than a preventative approach to ensure the protection of water quality in the OAWs. Those corrective actions also lack critical specificity with regard to water supply, the ability to arrest and reverse water quality problems should they be detected, and the enforceability of conditions given varying jurisdiction over proposed monitoring areas.

The U.S. Forest Service's Final Environmental Impact Statement (FEIS) and supporting documentation conclude that the Rosemont Copper Project will adversely modify surface and groundwater hydrology, sediment transport, and pollutant loadings in the watershed. EPA believes the available evidence indicates a substantial risk to designated beneficial use standards (*e.g.*, fish, wildlife and habitat) set by the state for Davidson Canyon and Cienega Creek. The EPA recommends that no 401 certification be issued unless the discharger can implement specific preventative actions that provide a high degree of confidence that designated uses will be maintained.

Please do not hesitate to contact me with any questions or concerns you may have regarding the enclosed comments at (415) 947-8707.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Jane Diamond', with a large, stylized loop at the beginning and a horizontal line extending to the right.

Jane Diamond  
Director  
Water Division

cc: Jim Upchurch, U.S. Forest Service  
Colonel Kimberly Colloton, U.S. Army Corps of Engineers  
Jean Calhoun, U.S. Fish and Wildlife Service  
Ray Suazo, Bureau of Land Management  
Chuck Huckelberry, Pima County



**EPA Region 9 comments on the *Draft Section 401 Water Quality Certification for the Rosemont Copper Project* dated February 21, 2014 (Draft 401 Certification), and the *Basis for State 401 Certification Decision Rosemont Copper Project ACOE Application* No. SPL-2008-00816-MB (Basis for Decision)**

**Protecting “Outstanding” Water Quality Downstream of the Rosemont Mine**

The State of Arizona has designated reaches of both Davidson Canyon and Cienega Creek as OAWs due to, among other factors, their exceptional ecological and recreational significance and the presence of federally endangered and threatened species. Water quality in these reaches currently meets or exceeds applicable water quality standards, and any lowering of water quality in OAWs is prohibited.

ADEQ states in its Basis for Decision that, “In order to issue a State 401 water quality certification, ADEQ must be satisfied that any modifications to hydrology, sediment transport or water quality, as a result of the proposed activities under the § 404 permit, will not result in adverse water quality impacts to the downstream OAWs.”<sup>1</sup>

Rosemont Mine proposes no direct discharges to OAWs. However, as ADEQ acknowledges in its Basis for Decision, “As part of its certification process, ADEQ may impose additional controls, conditions or mitigation measures, on indirect discharges that occur upstream of or to tributaries of an OAW to maintain and protect existing water quality in a downstream OAW.”<sup>2</sup>

ADEQ has proposed the following additional measures in its Draft 401 Certification to maintain and protect existing water quality in Davidson Canyon and Cienega Creek:

**5.2 Specific Conditions**

- 1) Within 180 days of the effective date of the CWA 404 permit, the applicant shall submit to ADEQ, for review and approval, a surface water mitigation program designed to maintain aquatic and riparian resources at pre-project levels in Davidson Canyon and Lower Cienega Creek. The program shall include, but is not limited to, a description of measures that will be taken to offset predicted reductions in surface water flow, in response to the project, along with a proposed schedule for implementation. The Final Environmental Impact Statement (FEIS) predicts a 17.2% reduction in average annual post-closure stormwater runoff volume as a result of the proposed activities. The surface water mitigation program shall describe measures that will offset the reduced runoff volume should it occur. The draft mitigation program shall be submitted to the address and contact person in Section 4.0.

---

<sup>1</sup> Basis for Decision at pg. 2.

<sup>2</sup> Basis for Decision at pg. 2; *see also* ADEQ Draft Antidegradation Implementation Procedures (April 2008) at pg. 4 (“ADEQ will impose whatever controls are necessary on indirect discharges that occur upstream of or to tributaries of an OAW to maintain and protect existing water quality in a downstream OAW.”) Available at: [http://www.azdeq.gov/envirom/water/standards/download/draft\\_anti.pdf](http://www.azdeq.gov/envirom/water/standards/download/draft_anti.pdf).



The mitigation program shall identify measures, as necessary, to ensure that any water used to mitigate a predicted reduction in stream flows, meets applicable Arizona surface water quality standards, including for Outstanding Arizona Waters, where applicable.

Within 30 days of ADEQ approval of the program, the applicant shall implement the approved mitigation program in accordance with the schedule set forth in the approved program. Should the results of required monitoring and/or revised hydrologic modeling (FEIS Mitigation Measures FS-BR-22, FS-BR-27, FS-GW-02, FS-SR-05) indicate that water quality in Davidson Canyon or Lower Cienega Creek is adversely affected by the activities certified herein, ADEQ may request that the COE suspend the CWA 404 Permit and require additional mitigation.

ADEQ found that if Rosemont adheres to the conditions and mitigation in the 401 Certification (*i.e.*, Specific Conditions 5.2), and also to CWA § 404 permit conditions, the U.S. Forest Service's Final Environmental Impact Statement's (FEIS) mitigation measures, and the State's 2010 Mining AZPDES Multi Sector General Permit's requirements, then the Rosemont Copper Project should not cause or contribute to exceedences of surface water quality standards nor cause water quality degradation in the downstream receiving waters including Davidson Canyon Wash and Cienega Creek.<sup>3</sup> ADEQ based its finding on a consideration of the following 5 factors:

1. Change in ambient concentrations predicted at the appropriate critical flow conditions and the nature, persistence and potential effects of the parameter;
2. Changes in loadings and the nature, persistence and potential effects of the parameter;
3. Reduction in available assimilative capacity;
4. Degree of confidence in the various components of any modeling technique utilized; and
5. Potential for cumulative effects.

After a careful review of ADEQ's consideration of these five factors, EPA believes ADEQ's certification decision, and its finding that the current conditions and mitigation in the 401 certification (*i.e.*, Specific Conditions 5.2) will prevent water quality degradation in Davidson Wash and Cienega Creek, is not justified and the risk of water quality degradation remains high. EPA provides further consideration of the five factors, as discussed below:

#### **Factors 1 and 2: Sediment is a critical and under-analyzed water quality parameter**

As ADEQ correctly acknowledges in its Basis for Decision, changes to sediment transport in streams can adversely affect water quality by increasing total suspended sediment in surface water flows and altering the physical integrity of the system, thereby causing problems with scour or aggradation which have the potential to result in water quality degradation.<sup>4</sup> ADEQ also recognizes that potential impacts on surface water quality due to the proposed fill activities could include changes in downstream sediment yield and therefore changes in geomorphology caused by the loss of waters of the U.S.<sup>5</sup> Yet,

---

<sup>3</sup> Basis for Decision at pg. 3.

<sup>4</sup> Basis for Decision at pg. 8.

<sup>5</sup> Basis for Decision at pp. 6 and 8.



ADEQ concludes that the proposed fill activities will not have a significant impact on the geomorphology of Barrel and Davidson Canyons.

To draw these conclusions of no significant impact, ADEQ relies on a very limited review of sediment transport effects. ADEQ uses the US Forest Service's (USFS) geomorphic assessment of Barrel Creek by Patterson and Annandale (2012), a 2-day survey using three variables: sediment availability, channel geometry, and water flow. Patterson and Annandale reason that since the Rosemont mine impacts 13% of the entire catchment area, there would not be significant impact to the fluvial geomorphology of the stream system.<sup>6</sup> This conclusion presumes a simple and direct proportionality of the Rosemont mine's sediment contribution to other parts of the watershed, and considers no temporal variability. In reality, the impacts of mining activities on sediment transport are likely to change over time during the active mine life and after closure, with potentially significant consequences to channel stability and aquatic and riparian habitat. Thus, suspended and bedload transport analyses are necessary to evaluate the impacts to OAWs from mine-driven sediment changes.

Without the benefit of these additional analyses, EPA believes that ADEQ would be premature to conclude that there will be little change to lower Davidson Canyon's geomorphology (and water quality) as a result of the fill.

### **Factor 3: Reduction in available assimilative capacity**

According to the FEIS, natural stormwater runoff that currently feeds the OAWs will be diminished up to 40% over the 24.5 – 30 year life of the mine.<sup>7</sup> ADEQ acknowledges a post-closure reduction in runoff volume of 17.2%, and concludes that this reduction could result in a potential loss of assimilative capacity and therefore potential degradation of water quality and/or riparian areas.<sup>8</sup>

For 404 permitting purposes, the Corps of Engineers requested that Rosemont conduct an analysis of indirect impacts from stormwater diversion. Considering the attenuation of impacts as the contributing watershed becomes larger, Rosemont calculated a reduction in average annual volume of stormwater flow in the Davidson Canyon OAW of approximately 8%, resulting in indirect impacts to 2.2 acres of surface waters within the OAWs during Rosemont mine operation.<sup>9</sup> EPA maintains Rosemont's analysis is flawed and the reduction in stormwater flow will adversely affect the entire wetted channel of the OAW. Rosemont did not calculate the indirect impacts to Lower Cienega Creek.

To address predicted reductions in runoff volume, the draft certification proposes that Rosemont develop and implement a surface water mitigation program designed to maintain aquatic and riparian resources at pre-project levels in Davidson Canyon and Lower Cienega Creek. The program shall include measures to offset predicted reductions in surface water flow (17.2% at post-closure), and a proposed schedule for implementation.<sup>10</sup>

---

<sup>6</sup> Basis for Decision at pg. 8.

<sup>7</sup> FEIS, Volume 2, Chapter 3, Table 66. Summary of effects

<sup>8</sup> Basis for Decision at pg. 10.

<sup>9</sup> Email from Brian Lindenlaub, Westlands Resources, to Elizabeth Goldmann, EPA dated January 15, 2014.

<sup>10</sup> Basis for Decision at p. 11, Draft 401 Certification, Specific Condition 5.2.1.



EPA appreciates ADEQ's inclusion of this Special Condition. EPA, however, is concerned that there is inadequate detail or certainty about the prospective surface water mitigation program's ability to offset the reduction in available assimilative capacity. For instance, EPA believes that since the 401 certification's coverage extends over the entire active mine period, and since the natural stormwater runoff that currently feeds the OAWs will be diminished up to 40% over the 24.5 – 30 year life of the mine, the mitigation targets should be based on the 40% surface runoff reductions predicted during the life of the mine, as opposed to the 17.2% post-closure reductions estimated by ADEQ.

In addition, the potential strategies described in the draft 401 certification to offset loss (*e.g.*, purchasing, retiring, severing and transferring of water rights) depend on administrative actions that are not certain to occur. Without certainty of measurable water supply and delivery, and corresponding contingencies for failure to secure such water, EPA does not believe these activities may be reasonably relied upon to replace the loss of wet water in the OAWs and prevent their degradation. We therefore recommend that ADEQ have Rosemont submit its surface water mitigation program to ADEQ for approval *prior* to issuance of the 401 water quality certification to ensure that Rosemont has secured enough available "wet" water to maintain aquatic and riparian resources at pre-project levels in Davidson Canyon and Lower Cienega Creek.

#### **Factor 4: Degree of Confidence in various components of any modeling technique utilized**

In its Basis for Decision, ADEQ correctly notes the uncertainty of the USFS models in predicting impacts to downstream waters.<sup>11</sup> ADEQ concludes that based on modeling and observation (*e.g.*, models, Tetra Tech field observations, SRK Consulting review), Lower Davidson Canyon is not hydraulically connected to the regional aquifer that would be impacted by pit dewatering.<sup>12</sup> With regard to Lower Cienega Creek, ADEQ states the potential reduction in perennial stream flow would be driven by the reduction in contribution from both Davidson Canyon and Upper Cienega Creek, but this reduction in surface flows would be minimal.<sup>13</sup>

The EPA believes that the uncertainty associated with available modeling does not support the above conclusions. Uncertainty equates to greater risk, which argues for a more protective or precautionary application of standards.

As previously stated, changes in sediment loading and a reduction in assimilative capacity will adversely affect water quality in Davidson Canyon and Lower Cienega Creek OAWs. In addition, pit dewatering will adversely impact approximately 20 miles of the Upper Cienega Creek OAW. According to the FEIS, the best-fit models show that mine related groundwater drawdown will result in intermittent conditions in Upper Cienega Creek after 150 years. By 150 years after closure, the risk of dry or low-flow conditions occurring in Upper Cienega Creek would increase to 88-283 days per year. Another model estimate shows Cienega Creek becoming intermittent within 50-150 years.<sup>14</sup> As a contributing

---

<sup>11</sup> Basis for Decision at p. 11.

<sup>12</sup> Basis for Decision at p. 11.

<sup>13</sup> Basis for Decision at p. 13.

<sup>14</sup> FEIS, Chapter 3, Table 108.



surface water source to Lower Cienega Creek, reductions in flow in Upper Cienega Creek will result in degradation of water quality in downstream OAW receiving waters.

#### **Factor 5: Potential for Cumulative Impacts**

EPA concludes from a careful read of the evaluation of cumulative impacts contained in the Basis for Decision that the scope and magnitude of impacts associated with the proposed Rosemont Copper Project, and the context in which these impacts will occur, have not been adequately presented.<sup>15</sup> The Rosemont mine represents an assemblage of impacts that are additive to the existing trend of declining water availability due to climate change, drought, and other factors. Insufficient information is provided in the draft certification and the Basis for Decision to demonstrate that the implementation of a surface water mitigation program will replace flows being captured or truncated from the proposed mine, either as a stand-alone impact or in the context of cumulative impacts to water quality such as drought and climate change.

#### **Monitoring for sediment and flow changes**

In general, impacts should be avoided wherever practicable prior to contemplating ways they can be minimized or mitigated. In the case of water quality in OAWs, impacts must be avoided by definition. The draft certification proposes corrective action should impacts to geomorphology occur, but it is unclear whether corrective measures can be put in place to prevent the degradation of OAWs should scour or aggradation be detected, or whether these measures can be effective given the potential lag time between detection and implementation of potential remedies.<sup>16</sup>

The USFS will require the Rosemont mine to monitor sediment between the mine and SR83 to identify areas of scour or aggradation (FEIS mitigation measure FS-SR-05), and Rosemont has agreed to share these data with ADEQ. However, these measures are only applicable on USFS lands; the USFS has no authority, obligation, or expertise to determine or enforce compliance with other agencies' laws or regulations.<sup>17</sup> In addition, based on the monitoring locations on USFS lands, it is questionable whether these monitoring measures and sites would capture changes to the beneficial uses associated with water quality standards at downstream OAWs.

EPA also believes Specific Condition 5.2.1 would benefit from a clearer description of the suspension procedures triggered if degradation is detected. Currently, the draft certification's proposed condition 5.2.1 states that ADEQ "may request" suspension of the CWA 404 permit if degradation is detected and require additional mitigation. However, the condition lacks specificity on implementation and timing of the suspension process and remedies, if any, should monitoring show degradation of an OAW. At minimum, adverse changes in water quality detected in OAWs should require immediate suspension of the 401 certification (and thus of the CWA 404 permit).

---

<sup>15</sup> Basis for Decision at p. 13.

<sup>16</sup> Basis for Decision at p. 8.

<sup>17</sup> FEIS, Appendix B, Page B-3

## Other Water Quality Concerns

A Corps Memorandum dated October 29, 2009 addresses water quality certification as follows, "The state's certification of compliance with applicable effluent limitations and water quality standards will be considered conclusive with respect to water quality considerations, unless the Regional Administrator (RA) of the U.S. Environmental Protection Agency (U.S. EPA) notifies the district engineer of "other water quality aspects" that should be taken into consideration when making a decision on a permit application for an activity that results in a discharge of dredged or fill material into waters of the United States."<sup>18</sup>

EPA first notified the District Engineer of water quality concerns in a letter dated February 13, 2012. If the state's 401 water quality certification is not modified to adequately address the concerns regarding the protection of Davidson Canyon and Cienega Creek, EPA expects to request the District Engineer evaluate these particular water quality issues raised and documented by EPA both for purposes of the Corps public interest review at 33 CFR 320.4(d) and compliance with 40 CFR 230.10(b)(1) in the decision document for the §404 Clean Water Act permit action.

---

<sup>18</sup> Memorandum for Major Subordinate Commands and District Commands Subject: Water Quality Certification dated October 29, 2009 at p. 1.



**From:** [Goldmann, Elizabeth](#)  
**To:** [Blaine, Marjorie E SPL](#)  
**Subject:** Other water Quality Aspects ltr to Corps  
**Date:** Wednesday, April 22, 2015 8:47:00 AM  
**Attachments:** [EPA ltr to Corps regarding other water quality aspects - Rosemont Mine.pdf](#)

---

Good morning Marjorie!

FYI...I am attaching the water quality letter with a new pdf. title to reflect the subject matter.

I am working in the office today.

Thanks! E.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street  
San Francisco, CA 94105-3901

APR 14 2015

OFFICE OF THE  
REGIONAL ADMINISTRATOR

Colonel Kim Colloton  
District Engineer, Los Angeles District  
U.S. Army Corps of Engineers  
P.O. Box 532711  
Los Angeles, California 90053-2325

Subject: "Other Water Quality Aspects" of permit issuance for the Rosemont Mine in light of state actions under §401 of the Clean Water Act

Dear Colonel Colloton:

On February 3, 2015, the Arizona Department of Environmental Quality (ADEQ) issued the Clean Water Act (CWA) §401 Water Quality Certification (certification) for the proposed Rosemont Copper Project (Rosemont mine) in Pima County, Arizona. After careful review and consultation with the state, EPA has determined that the impacts of the project include substantial water quality aspects which may be outside the scope of the state's §401 certification review. Thus, EPA believes the certification alone is unlikely to provide sufficient measures to safeguard the water quality of the Cienega Creek watershed, including stream reaches meeting or exceeding existing water quality standards under CWA §303 (these CWA "Tier 3" waters in Arizona are designated "Outstanding Arizona Waters" or OAW).<sup>1</sup> As prescribed under Corps regulations at 33 CFR 320.4(d), I am requesting your consideration of these "other water quality aspects" when making your §404 CWA permit decision.<sup>2</sup>

The Rosemont Copper Project Final Environmental Impact Statement (FEIS) and other documentation concluded the Rosemont mine, if constructed, would adversely modify surface and groundwater hydrology, sediment transport, and pollutant loadings in the watershed. The state CWA §401 certification lacks sufficient, specific preventative actions to avoid these adverse impacts to water quality, creating a substantial risk to designated beneficial use standards set by the state for Davidson Canyon and Cienega Creek. In general, the certification relies upon limited, voluntary (i.e., non-enforceable) post-discharge monitoring that may detect water quality degradation after it occurs, and includes insubstantial corrective actions to be developed at a later time. Many of EPA's concerns identified in comments on the state's February 21, 2014 draft certification (letter attached) remain unaddressed by the final certification. Among the most critical water quality aspects that remain outstanding are:

1. **Water quality impact avoidance:** Without reasonable assurance of impact avoidance, the available information suggests Tier 3 antidegradation standards are very likely to be violated.

<sup>1</sup>Federal antidegradation policy prohibits any degradation of Tier 3 waters, regardless of economic or social development needs (40 CFR 131.2(a)). Arizona's anti degradation rules reinforce this prohibition (ACC R18-11-107).

<sup>2</sup> Corps Regulatory Guidance Letter 90-04 and the Memorandum for *Major Subordinate Commands and District Commands* dated October 29, 2009



2. **Water quality impact minimization:** A specific and complete monitoring program is necessary at the outset ensure rapid detection of impacts should a robust preventative program fail, and provide for the ability to deploy corrective measures;
3. **Water quality impact mitigation:** Specification of, and enforceable commitment to, available and sufficient corrective measures are needed to offset mine-related reduction of assimilative capacity, changes in downstream sediment yield, and other potential diminutions of water quality that may be detected. Presently, the corrective measures proposed in a “Surface Water Mitigation Plan” lack specificity regarding their ability to arrest and reverse water quality problems once water quality degradation of OAWs or other waters has been detected.<sup>3</sup>

We believe these water quality aspects are directly relevant to several of the Corps’ findings necessary for a permit decision, under both the 404(b)(1) Guidelines and Public Interest Review. The state’s inclusion of general and specific conditions in the certification are highly unlikely to avoid potential water quality degradation, detect anticipated or unanticipated degradation, or mitigate for those impacts. The project’s projected groundwater drawdown and flow and sediment reductions in Davidson Canyon and Cienega Creek have yet to be adequately addressed. These outcomes would represent a failure to maintain and protect existing water quality in those OAWs in violation of the CWA antidegradation policy. The certified discharges of fill material would thus contribute to violation of applicable water quality standards, in conflict with the Guidelines at 40 CFR 230.10(b).

The Corps’ permit decision also includes an evaluation of the impacts of the proposed project on water supply and conservation (33 CFR 320.4). Within the Tucson Active Management Area (AMA), a population of over 811,000 obtains 69% of its municipal water supplies from groundwater. Agriculture relies on subsurface supply to provide 70% of its water.<sup>4</sup> The Upper Santa Cruz subbasin, where Rosemont is sited, provides 20% of the groundwater recharge in the Tucson AMA.<sup>5</sup> The mine’s water needs would represent a new demand that increases pumping by 6-7% during an overall drying trend.<sup>6</sup> Drought, climate change, and the significant uncertainty regarding the potential to successfully recharge subsurface supplies, only heighten EPA’s concerns over Rosemont mine’s projected water use in an aquifer already subject to groundwater overdraft.<sup>7</sup>

According to the FEIS, groundwater pumping for the mining operation and drawdown from the open pit will adversely impact public and private water supplies.<sup>8</sup> As a result of pumping groundwater for the mine, an estimated 500-550 private and municipal wells would be impacted by drawdown in groundwater levels over ten feet.<sup>9</sup> Groundwater drawdown from the mine’s pit within the Davidson Canyon/Cienega Basin, would impact an additional estimated 360-370 well owners with water level

---

<sup>3</sup>The SWMP developed under the certification does not meet its stated objective of describing mitigation commitments to offset predicted reductions in surface water flows and sediment yield. For example, it proposes a conceptual mitigation water supply of insufficient quantity to offset flow reductions predicted by the FEIS, and provides no assurance of that water’s future availability.

<sup>4</sup> [www.azwater.gov/azdwr/StatewidePlanning/WaterAtlas/ActiveManagementAreas/Volume\\_8/final.pdf](http://www.azwater.gov/azdwr/StatewidePlanning/WaterAtlas/ActiveManagementAreas/Volume_8/final.pdf).

<sup>5</sup>Letter to Jared Blumenfeld, EPA Regional Administrator, and Colonel Kim Colloton, Corps District Engineer, from Ray Carol, Pima County Supervisor dated November 18, 2014.

<sup>6</sup> FEIS, p. 338.

<sup>7</sup> FEIS, p. 322 and p. 328.

<sup>8</sup> FEIS, pp. 328-329.

<sup>9</sup> FEIS, p. 330 and Table 58, p. 337. Groundwater drawdown is estimated at up to 90 feet adjacent mine site pumping, and up to 10 feet within an approximately 3-4 mile radius (42 square miles).



declines ranging from 15-85 feet.<sup>10</sup> Private and public well owners and suppliers have expressed concern regarding the impact on the quality and quantity of their water supply, as well as the increased costs associated with pumping from a deeper aquifer if the mine is constructed.<sup>11</sup> Rosemont mine proposes to conduct groundwater recharge as a voluntary measure, but the location and effectiveness of recharge is unknown and, therefore, may not benefit the Upper Santa Cruz subbasin.<sup>12</sup>

Finally, the Cienega Creek watershed is located in a near pristine landscape rich in biodiversity. As such, it is an important location for outdoor recreation. The State of Arizona has designated reaches of both Davidson Canyon and Cienega Creek as OAWs due to, among other factors, their exceptional ecological and recreational significance and the presence of federally endangered and threatened species. Water quality in these reaches currently meets or exceeds applicable water quality standards, and any lowering of water quality in OAWs is prohibited. Public and private utilization of this habitat contributes to a robust recreation and tourism industry in the region.<sup>13</sup> Loss of recreational and aesthetic value stemming from the mine's various adverse impacts to water quality are an important additional consideration in permit authorization (33 CFR 320.4).

In summary, sufficient evidence exists to conclude that several water quality aspects that may be beyond the scope of the state's §401 water quality certification remain outstanding, which EPA recommends be considered in your findings under the §404(b)(1) Guidelines and Public Interest Review. Please do not hesitate to contact me with any questions, or have your Regulatory Division Chief contact Jason Brush, our Wetlands Section Supervisor, at (415) 972-3483.

Sincerely,



Jared Blumenfeld

Enclosure: EPA letter to ADEQ dated April 7, 2014

cc: Jim Upchurch, U.S. Forest Service  
Steve Spangle, U.S. Fish and Wildlife Service  
Ray Suazo, Bureau of Land Management  
Trevor Baggione, Arizona Department of Environmental Quality

---

<sup>10</sup> FEIS, p. 350.

<sup>11</sup> Letter to Jared Blumenfeld, EPA Regional Administrator and Colonel Kim Colloton, Corps District Engineer dated November 12, 2014 signed by 76 private well owners and public water suppliers and users.

<sup>12</sup> FEIS, pp. 360-361. In addition, Rosemont Mine offered a legally binding residential well protection plan valid during the operation of the mine, but not all well owners have agreed to sign the agreement.

<sup>13</sup> \$2.95 billion is spent annually for tourism and outdoor recreational activities in Pima and Santa Cruz Counties. An analysis by Sonoran Institute estimates a one percent reduction of travel and tourism-related spending in the region would result in an economic loss greater than the entire annual payroll of the mine. J.E. Marlow. 2007. *Mining's Potential Economic Impacts in the Santa Rita and Patagonia Mountains Region of Southeastern Arizona*. Sonoran Institute Study.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street  
San Francisco, CA 94105-3901

APR 07 2014

Michael Fulton, Water Quality Division Director  
Arizona Department of Environmental Quality  
Surface Water Section/State 401 Certification/MS 5415A-1  
1110 West Washington Street  
Phoenix, Arizona 85007

Subject: State of Arizona Clean Water Act (CWA) Draft Section 401 Water Quality Certification for  
the Rosemont Copper Project, Pima County, Arizona

Dear Mr. Fulton:

Thank you for the extended opportunity to review the draft CWA Section 401 water quality certification (certification) and supporting information for discharges associated with the proposed Rosemont Copper Project. With Arizona's designation of portions of the Cienega Creek watershed as "Outstanding Arizona Waters" (OAWs), the EPA supports the state's broadest exercise of legal discretion to protect these remarkable resources. We are submitting the enclosed comments as a continuation of our interagency coordination on the mine's potential water quality consequences to the OAWs of the Cienega Creek watershed.

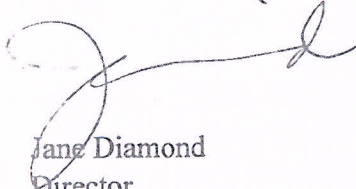
After careful consideration, EPA believes the draft certification and supporting information provide an insufficient basis from which to conclude existing water quality will be maintained (*e.g.*, ongoing attainment of designated beneficial uses). In general, the draft certification relies on lagging indicators (post-discharge monitoring) to trigger corrective actions, rather than a preventative approach to ensure the protection of water quality in the OAWs. Those corrective actions also lack critical specificity with regard to water supply, the ability to arrest and reverse water quality problems should they be detected, and the enforceability of conditions given varying jurisdiction over proposed monitoring areas.

The U.S. Forest Service's Final Environmental Impact Statement (FEIS) and supporting documentation conclude that the Rosemont Copper Project will adversely modify surface and groundwater hydrology, sediment transport, and pollutant loadings in the watershed. EPA believes the available evidence indicates a substantial risk to designated beneficial use standards (*e.g.*, fish, wildlife and habitat) set by the state for Davidson Canyon and Cienega Creek. The EPA recommends that no 401 certification be issued unless the discharger can implement specific preventative actions that provide a high degree of confidence that designated uses will be maintained.



Please do not hesitate to contact me with any questions or concerns you may have regarding the enclosed comments at (415) 947-8707.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Jane Diamond', with a large, stylized loop at the beginning and a horizontal stroke extending to the right.

Jane Diamond  
Director  
Water Division

cc: Jim Upchurch, U.S. Forest Service  
Colonel Kimberly Colloton, U.S. Army Corps of Engineers  
Jean Calhoun, U.S. Fish and Wildlife Service  
Ray Suazo, Bureau of Land Management  
Chuck Huckelberry, Pima County

**EPA Region 9 comments on the *Draft Section 401 Water Quality Certification for the Rosemont Copper Project* dated February 21, 2014 (Draft 401 Certification), and the *Basis for State 401 Certification Decision Rosemont Copper Project ACOE Application* No. SPL-2008-00816-MB (Basis for Decision)**

**Protecting “Outstanding” Water Quality Downstream of the Rosemont Mine**

The State of Arizona has designated reaches of both Davidson Canyon and Cienega Creek as OAWs due to, among other factors, their exceptional ecological and recreational significance and the presence of federally endangered and threatened species. Water quality in these reaches currently meets or exceeds applicable water quality standards, and any lowering of water quality in OAWs is prohibited.

ADEQ states in its Basis for Decision that, “In order to issue a State 401 water quality certification, ADEQ must be satisfied that any modifications to hydrology, sediment transport or water quality, as a result of the proposed activities under the § 404 permit, will not result in adverse water quality impacts to the downstream OAWs.”<sup>1</sup>

Rosemont Mine proposes no direct discharges to OAWs. However, as ADEQ acknowledges in its Basis for Decision, “As part of its certification process, ADEQ may impose additional controls, conditions or mitigation measures, on indirect discharges that occur upstream of or to tributaries of an OAW to maintain and protect existing water quality in a downstream OAW.”<sup>2</sup>

ADEQ has proposed the following additional measures in its Draft 401 Certification to maintain and protect existing water quality in Davidson Canyon and Cienega Creek:

**5.2 Specific Conditions**

- 1) Within 180 days of the effective date of the CWA 404 permit, the applicant shall submit to ADEQ, for review and approval, a surface water mitigation program designed to maintain aquatic and riparian resources at pre-project levels in Davidson Canyon and Lower Cienega Creek. The program shall include, but is not limited to, a description of measures that will be taken to offset predicted reductions in surface water flow, in response to the project, along with a proposed schedule for implementation. The Final Environmental Impact Statement (FEIS) predicts a 17.2% reduction in average annual post-closure stormwater runoff volume as a result of the proposed activities. The surface water mitigation program shall describe measures that will offset the reduced runoff volume should it occur. The draft mitigation program shall be submitted to the address and contact person in Section 4.0.

---

<sup>1</sup> Basis for Decision at pg. 2.

<sup>2</sup> Basis for Decision at pg. 2; *see also* ADEQ Draft Antidegradation Implementation Procedures (April 2008) at pg. 4 (“ADEQ will impose whatever controls are necessary on indirect discharges that occur upstream of or to tributaries of an OAW to maintain and protect existing water quality in a downstream OAW.”) Available at: [http://www.azdeq.gov/envirom/water/standards/download/draft\\_anti.pdf](http://www.azdeq.gov/envirom/water/standards/download/draft_anti.pdf).



The mitigation program shall identify measures, as necessary, to ensure that any water used to mitigate a predicted reduction in stream flows, meets applicable Arizona surface water quality standards, including for Outstanding Arizona Waters, where applicable.

Within 30 days of ADEQ approval of the program, the applicant shall implement the approved mitigation program in accordance with the schedule set forth in the approved program. Should the results of required monitoring and/or revised hydrologic modeling (FEIS Mitigation Measures FS-BR-22, FS-BR-27, FS-GW-02, FS-SR-05) indicate that water quality in Davidson Canyon or Lower Cienega Creek is adversely affected by the activities certified herein, ADEQ may request that the COE suspend the CWA 404 Permit and require additional mitigation.

ADEQ found that if Rosemont adheres to the conditions and mitigation in the 401 Certification (*i.e.*, Specific Conditions 5.2), and also to CWA § 404 permit conditions, the U.S. Forest Service's Final Environmental Impact Statement's (FEIS) mitigation measures, and the State's 2010 Mining AZPDES Multi Sector General Permit's requirements, then the Rosemont Copper Project should not cause or contribute to exceedences of surface water quality standards nor cause water quality degradation in the downstream receiving waters including Davidson Canyon Wash and Cienega Creek.<sup>3</sup> ADEQ based its finding on a consideration of the following 5 factors:

1. Change in ambient concentrations predicted at the appropriate critical flow conditions and the nature, persistence and potential effects of the parameter;
2. Changes in loadings and the nature, persistence and potential effects of the parameter;
3. Reduction in available assimilative capacity;
4. Degree of confidence in the various components of any modeling technique utilized; and
5. Potential for cumulative effects.

After a careful review of ADEQ's consideration of these five factors, EPA believes ADEQ's certification decision, and its finding that the current conditions and mitigation in the 401 certification (*i.e.*, Specific Conditions 5.2) will prevent water quality degradation in Davidson Wash and Cienega Creek, is not justified and the risk of water quality degradation remains high. EPA provides further consideration of the five factors, as discussed below:

#### **Factors 1 and 2: Sediment is a critical and under-analyzed water quality parameter**

As ADEQ correctly acknowledges in its Basis for Decision, changes to sediment transport in streams can adversely affect water quality by increasing total suspended sediment in surface water flows and altering the physical integrity of the system, thereby causing problems with scour or aggradation which have the potential to result in water quality degradation.<sup>4</sup> ADEQ also recognizes that potential impacts on surface water quality due to the proposed fill activities could include changes in downstream sediment yield and therefore changes in geomorphology caused by the loss of waters of the U.S.<sup>5</sup> Yet,

---

<sup>3</sup> Basis for Decision at pg. 3.

<sup>4</sup> Basis for Decision at pg. 8.

<sup>5</sup> Basis for Decision at pp. 6 and 8.



ADEQ concludes that the proposed fill activities will not have a significant impact on the geomorphology of Barrel and Davidson Canyons.

To draw these conclusions of no significant impact, ADEQ relies on a very limited review of sediment transport effects. ADEQ uses the US Forest Service's (USFS) geomorphic assessment of Barrel Creek by Patterson and Annandale (2012), a 2-day survey using three variables: sediment availability, channel geometry, and water flow. Patterson and Annandale reason that since the Rosemont mine impacts 13% of the entire catchment area, there would not be significant impact to the fluvial geomorphology of the stream system.<sup>6</sup> This conclusion presumes a simple and direct proportionality of the Rosemont mine's sediment contribution to other parts of the watershed, and considers no temporal variability. In reality, the impacts of mining activities on sediment transport are likely to change over time during the active mine life and after closure, with potentially significant consequences to channel stability and aquatic and riparian habitat. Thus, suspended and bedload transport analyses are necessary to evaluate the impacts to OAWs from mine-driven sediment changes.

Without the benefit of these additional analyses, EPA believes that ADEQ would be premature to conclude that there will be little change to lower Davidson Canyon's geomorphology (and water quality) as a result of the fill.

### **Factor 3: Reduction in available assimilative capacity**

According to the FEIS, natural stormwater runoff that currently feeds the OAWs will be diminished up to 40% over the 24.5 – 30 year life of the mine.<sup>7</sup> ADEQ acknowledges a post-closure reduction in runoff volume of 17.2%, and concludes that this reduction could result in a potential loss of assimilative capacity and therefore potential degradation of water quality and/or riparian areas.<sup>8</sup>

For 404 permitting purposes, the Corps of Engineers requested that Rosemont conduct an analysis of indirect impacts from stormwater diversion. Considering the attenuation of impacts as the contributing watershed becomes larger, Rosemont calculated a reduction in average annual volume of stormwater flow in the Davidson Canyon OAW of approximately 8%, resulting in indirect impacts to 2.2 acres of surface waters within the OAWs during Rosemont mine operation.<sup>9</sup> EPA maintains Rosemont's analysis is flawed and the reduction in stormwater flow will adversely affect the entire wetted channel of the OAW. Rosemont did not calculate the indirect impacts to Lower Cienega Creek.

To address predicted reductions in runoff volume, the draft certification proposes that Rosemont develop and implement a surface water mitigation program designed to maintain aquatic and riparian resources at pre-project levels in Davidson Canyon and Lower Cienega Creek. The program shall include measures to offset predicted reductions in surface water flow (17.2% at post-closure), and a proposed schedule for implementation.<sup>10</sup>

---

<sup>6</sup> Basis for Decision at pg. 8.

<sup>7</sup> FEIS, Volume 2, Chapter 3, Table 66. Summary of effects

<sup>8</sup> Basis for Decision at pg. 10.

<sup>9</sup> Email from Brian Lindenlaub, Westlands Resources, to Elizabeth Goldmann, EPA dated January 15, 2014.

<sup>10</sup> Basis for Decision at p. 11, Draft 401 Certification, Specific Condition 5.2.1.



EPA appreciates ADEQ's inclusion of this Special Condition. EPA, however, is concerned that there is inadequate detail or certainty about the prospective surface water mitigation program's ability to offset the reduction in available assimilative capacity. For instance, EPA believes that since the 401 certification's coverage extends over the entire active mine period, and since the natural stormwater runoff that currently feeds the OAWs will be diminished up to 40% over the 24.5 – 30 year life of the mine, the mitigation targets should be based on the 40% surface runoff reductions predicted during the life of the mine, as opposed to the 17.2% post-closure reductions estimated by ADEQ.

In addition, the potential strategies described in the draft 401 certification to offset loss (*e.g.*, purchasing, retiring, severing and transferring of water rights) depend on administrative actions that are not certain to occur. Without certainty of measurable water supply and delivery, and corresponding contingencies for failure to secure such water, EPA does not believe these activities may be reasonably relied upon to replace the loss of wet water in the OAWs and prevent their degradation. We therefore recommend that ADEQ have Rosemont submit its surface water mitigation program to ADEQ for approval *prior* to issuance of the 401 water quality certification to ensure that Rosemont has secured enough available "wet" water to maintain aquatic and riparian resources at pre-project levels in Davidson Canyon and Lower Cienega Creek.

#### **Factor 4: Degree of Confidence in various components of any modeling technique utilized**

In its Basis for Decision, ADEQ correctly notes the uncertainty of the USFS models in predicting impacts to downstream waters.<sup>11</sup> ADEQ concludes that based on modeling and observation (*e.g.*, models, Tetra Tech field observations, SRK Consulting review), Lower Davidson Canyon is not hydraulically connected to the regional aquifer that would be impacted by pit dewatering.<sup>12</sup> With regard to Lower Cienega Creek, ADEQ states the potential reduction in perennial stream flow would be driven by the reduction in contribution from both Davidson Canyon and Upper Cienega Creek, but this reduction in surface flows would be minimal.<sup>13</sup>

The EPA believes that the uncertainty associated with available modeling does not support the above conclusions. Uncertainty equates to greater risk, which argues for a more protective or precautionary application of standards.

As previously stated, changes in sediment loading and a reduction in assimilative capacity will adversely affect water quality in Davidson Canyon and Lower Cienega Creek OAWs. In addition, pit dewatering will adversely impact approximately 20 miles of the Upper Cienega Creek OAW. According to the FEIS, the best-fit models show that mine related groundwater drawdown will result in intermittent conditions in Upper Cienega Creek after 150 years. By 150 years after closure, the risk of dry or low-flow conditions occurring in Upper Cienega Creek would increase to 88-283 days per year. Another model estimate shows Cienega Creek becoming intermittent within 50-150 years.<sup>14</sup> As a contributing

---

<sup>11</sup> Basis for Decision at p. 11.

<sup>12</sup> Basis for Decision at p. 11.

<sup>13</sup> Basis for Decision at p. 13.

<sup>14</sup> FEIS, Chapter 3, Table 108.



surface water source to Lower Cienega Creek, reductions in flow in Upper Cienega Creek will result in degradation of water quality in downstream OAW receiving waters.

#### **Factor 5: Potential for Cumulative Impacts**

EPA concludes from a careful read of the evaluation of cumulative impacts contained in the Basis for Decision that the scope and magnitude of impacts associated with the proposed Rosemont Copper Project, and the context in which these impacts will occur, have not been adequately presented.<sup>15</sup> The Rosemont mine represents an assemblage of impacts that are additive to the existing trend of declining water availability due to climate change, drought, and other factors. Insufficient information is provided in the draft certification and the Basis for Decision to demonstrate that the implementation of a surface water mitigation program will replace flows being captured or truncated from the proposed mine, either as a stand-alone impact or in the context of cumulative impacts to water quality such as drought and climate change.

#### **Monitoring for sediment and flow changes**

In general, impacts should be avoided wherever practicable prior to contemplating ways they can be minimized or mitigated. In the case of water quality in OAWs, impacts must be avoided by definition. The draft certification proposes corrective action should impacts to geomorphology occur, but it is unclear whether corrective measures can be put in place to prevent the degradation of OAWs should scour or aggradation be detected, or whether these measures can be effective given the potential lag time between detection and implementation of potential remedies.<sup>16</sup>

The USFS will require the Rosemont mine to monitor sediment between the mine and SR83 to identify areas of scour or aggradation (FEIS mitigation measure FS-SR-05), and Rosemont has agreed to share these data with ADEQ. However, these measures are only applicable on USFS lands; the USFS has no authority, obligation, or expertise to determine or enforce compliance with other agencies' laws or regulations.<sup>17</sup> In addition, based on the monitoring locations on USFS lands, it is questionable whether these monitoring measures and sites would capture changes to the beneficial uses associated with water quality standards at downstream OAWs.

EPA also believes Specific Condition 5.2.1 would benefit from a clearer description of the suspension procedures triggered if degradation is detected. Currently, the draft certification's proposed condition 5.2.1 states that ADEQ "may request" suspension of the CWA 404 permit if degradation is detected and require additional mitigation. However, the condition lacks specificity on implementation and timing of the suspension process and remedies, if any, should monitoring show degradation of an OAW. At minimum, adverse changes in water quality detected in OAWs should require immediate suspension of the 401 certification (and thus of the CWA 404 permit).

---

<sup>15</sup> Basis for Decision at p. 13.

<sup>16</sup> Basis for Decision at p. 8.

<sup>17</sup> FEIS, Appendix B, Page B-3

## Other Water Quality Concerns

A Corps Memorandum dated October 29, 2009 addresses water quality certification as follows, "The state's certification of compliance with applicable effluent limitations and water quality standards will be considered conclusive with respect to water quality considerations, unless the Regional Administrator (RA) of the U.S. Environmental Protection Agency (U.S. EPA) notifies the district engineer of "other water quality aspects" that should be taken into consideration when making a decision on a permit application for an activity that results in a discharge of dredged or fill material into waters of the United States."<sup>18</sup>

EPA first notified the District Engineer of water quality concerns in a letter dated February 13, 2012. If the state's 401 water quality certification is not modified to adequately address the concerns regarding the protection of Davidson Canyon and Cienega Creek, EPA expects to request the District Engineer evaluate these particular water quality issues raised and documented by EPA both for purposes of the Corps public interest review at 33 CFR 320.4(d) and compliance with 40 CFR 230.10(b)(1) in the decision document for the §404 Clean Water Act permit action.

---

<sup>18</sup> Memorandum for Major Subordinate Commands and District Commands Subject: Water Quality Certification dated October 29, 2009 at p. 1.